

Protocol for 50000-count professional dual display DMM series

*USB communication protocol: **Conform to USB HID1.1**

Commands to get read-time reading data:

| Report ID | Command 1 | Command 2 | Command 3 |
|-----------|-----------|-----------|-----------|
| 0x00 | 0x00 | 0x86 | 0x66 |

Real-time download: **Returned 27-byte data table** after sending out 4-byte requested **Commands**

TABLE 1. LCD map

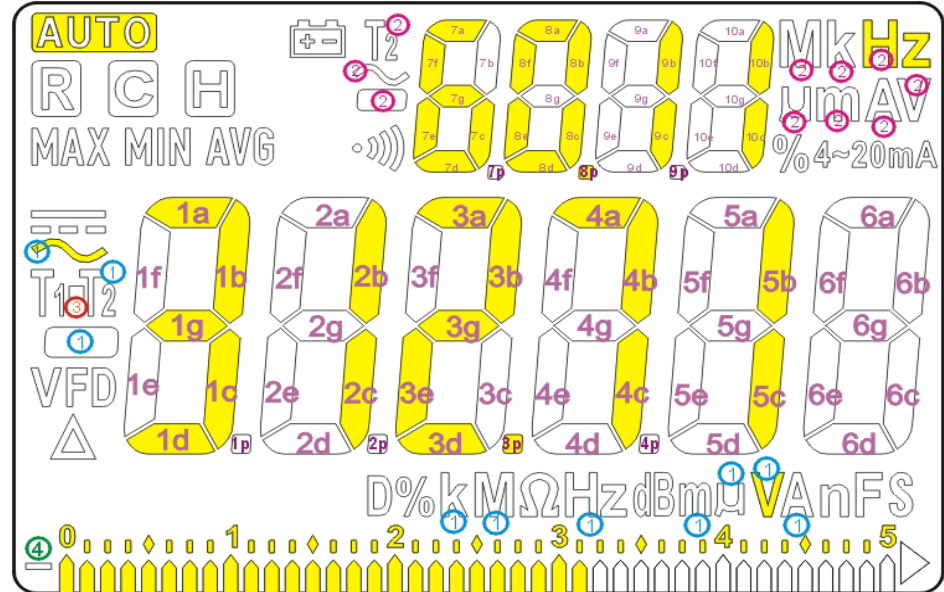
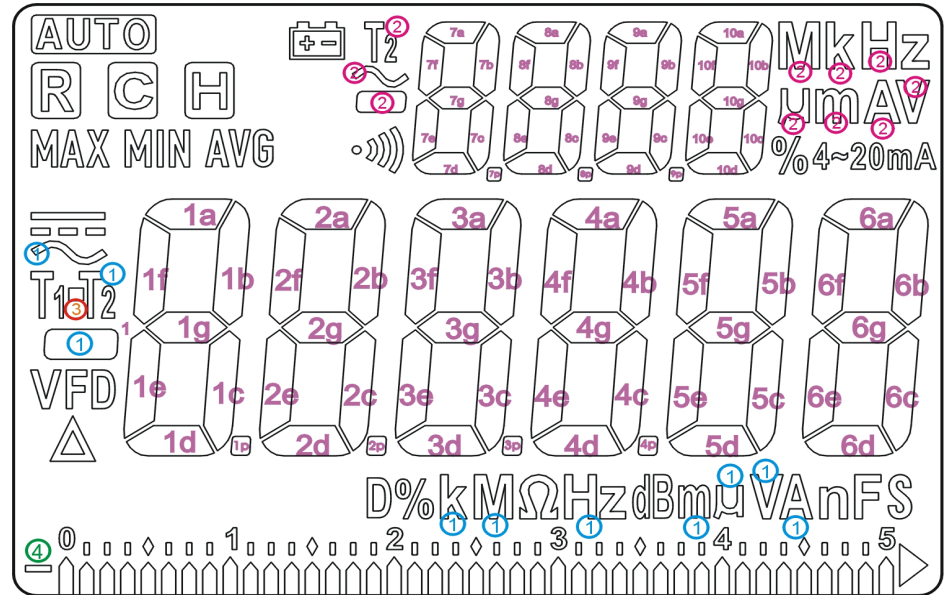
| Byte No. | bit 7 | bit 6 | bit 5 | bit 4 | bit 3 | bit 2 | bit 1 | bit 0 |
|----------|-----------------------|-------|-------|-----------|---------|-------|-------|-------|
| 1 | 0x00 (Report ID= I) | | | | | | | |
| 2 | don't care | | | | | | | |
| 3 | AVG | MIN | MAX | bar scale | T2 | C | R | AUTO |
| 4 | 1b | 1g | 1c | 1d | 1a | 1f | 1e | 1p |
| 5 | 2b | 2g | 2c | 2d | 2a | 2f | 2e | 2p |
| 6 | 3b | 3g | 3c | 3d | 3a | 3f | 3e | 3p |
| 7 | 4b | 4g | 4c | 4d | 4a | 4f | 4e | 4p |
| 8 | 5b | 5g | 5c | 5d | 5a | 5f | 5e | 5p |
| 9 | 0x00 (Report ID= II) | | | | | | | |
| 10 | 6b | 6g | 6c | 6d | 6a | 6f | 6e | V |
| 11 | T2 | 2 | 2 | 2 | %4~20mA | A | m | u |
| 12 | 7b | 7g | 7c | 7d | 7a | 7f | 7e | 7p |
| 13 | 8b | 8g | 8c | 8d | 8a | 8f | 8e | 8p |
| 14 | 9b | 9g | 9c | 9d | 9a | 9f | 9e | 9p |
| 15 | 10b | 10g | 10c | 10d | 10a | 10f | 10e | 10p |
| 16 | A | n | F | S | V | Hz | k | M |
| 17 | D% | k | M | Ω | u | m | dB | Hz |
| 18 | 0x00 (Report ID= III) | | | | | | | |
| 19 | don't care | | | | | | | |
| 20 | Model ID3: 0x86 | | | | | | | |
| 21 | don't care | | | | | | | |
| 22 | don't care | | | | | | | |
| 23 | Model ID3: 0x86 | | | | | | | |
| 24 | don't care | | | | | | | |
| 25 | don't care | | | | | | | |
| 26 | don't care | | | | | | | |
| 27 | don't care | | | | | | | |

Example for "AC 312.17V / 60.11Hz" dual display reading, output data 27 bytes: 00h, xxh, 01h, 11h, F8h, A0h, DAh, A9h, A0h, 00h, 00h, 00h, 7Eh, BFh, A0h, A0h, 04h, 00h, 00h, xxh, xxh, xxh, 86h, xxh, xxh, xxh, xxh

| Byte No. | bit 7 | bit 6 | bit 5 | bit 4 | bit 3 | bit 2 | bit 1 | bit 0 |
|----------|-----------------------|-------|-------|-----------|---------|-------|-------|-------|
| 1 | 0x00 (Report ID= I) | | | | | | | |
| 2 | don't care | | | | | | | |
| 3 | AVG | MIN | MAX | bar scale | T2 | C | R | AUTO |
| 4 | 1b | 1g | 1c | 1d | 1a | 1f | 1e | 1p |
| 5 | 2b | 2g | 2c | 2d | 2a | 2f | 2e | 2p |
| 6 | 3b | 3g | 3c | 3d | 3a | 3f | 3e | 3p |
| 7 | 4b | 4g | 4c | 4d | 4a | 4f | 4e | 4p |
| 8 | 5b | 5g | 5c | 5d | 5a | 5f | 5e | 5p |
| 9 | 0x00 (Report ID= II) | | | | | | | |
| 10 | 6b | 6g | 6c | 6d | 6a | 6f | 6e | V |
| 11 | T2 | 2 | 2 | 2 | %4~20mA | A | m | u |
| 12 | 7b | 7g | 7c | 7d | 7a | 7f | 7e | 7p |
| 13 | 8b | 8g | 8c | 8d | 8a | 8f | 8e | 8p |
| 14 | 9b | 9g | 9c | 9d | 9a | 9f | 9e | 9p |
| 15 | 10b | 10g | 10c | 10d | 10a | 10f | 10e | 10p |
| 16 | A | n | F | S | V | Hz | k | M |
| 17 | D% | k | M | Ω | u | m | dB | Hz |
| 18 | 0x00 (Report ID= III) | | | | | | | |
| 19 | don't care | | | | | | | |
| 20 | Model ID3: 0x86 | | | | | | | |
| 21 | don't care | | | | | | | |
| 22 | don't care | | | | | | | |
| 23 | Model ID3: 0x86 | | | | | | | |
| 24 | don't care | | | | | | | |
| 25 | don't care | | | | | | | |
| 26 | don't care | | | | | | | |
| 27 | don't care | | | | | | | |

* x: don't care

FIG 1. LCD



- 00h
- xxh
- 01h
- 11h
- F8h
- A0h
- DAh
- A9h
- A0h
- 00h
- 00h
- 7Eh
- BFh
- A0h
- A0h
- 04h
- 00h
- 00h
- xxh
- xxh
- xxh
- 86h
- xxh
- xxh
- xxh
- xxh

Proposal program design flowchart

